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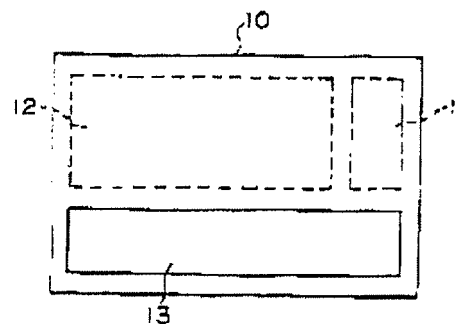
(54) [Title of the Invention] Thin-Type Contactless IC Card

(57) [Abstract]

[Purpose] To provide a thin-type contactless IC card, being a contactless IC card containing an IC module and a reception/transmission coil connected to the IC module for performing reception and transmission of signals contactlessly with an external device, and having improved portability by making the thickness thinner as a thin-type card form, and also having improved strength against bending and impact.

[Constitution] A thin-type contactless IC card, wherein a thin-type IC module and a thin-type reception/transmission coil are disposed on a plane without being made to overlap, in addition, plastic films are interposed on both sides of the thin-type IC module and the thin-type reception/transmission coil, furthermore they are held between plastic surface members from both sides, and they are fixed and integrated by thermocompression bonding.

[Effect] The portability is improved by making the thickness thinner as a thin-type card form, also the strength is improved against bending and impact, and the thin-type IC module and the thin-type reception/transmission coil are assuredly blocked from the outside, whereby it is possible to prevent damage to the thin-type IC module and the thin-type reception/transmission coil by intrusion of water from the outside.



P1452

[Claims]

[Claim 1] A thin-type contactless IC card, being a thin-type contactless IC card containing a thin-type IC module and a thin-type reception/transmission coil connected to the IC module for performing reception and transmission of signals contactlessly with an external device, and characterized in that said thin-type IC module and thin-type reception/transmission coil are disposed on a plane without being made to overlap, in addition, plastic films are interposed on both sides of the thin-type IC module and the thin-type reception/transmission coil, furthermore they are held between plastic surface members from both sides, and they are fixed and integrated by thermocompression bonding.

[Detailed Explanation of the Invention]

[0001]

[Field of Use in the Industry] The present invention relates to a contactless IC card containing an IC module and a reception/transmission coil connected to the IC module for performing reception and transmission of signals contactlessly with an external device, and in particular it relates to a thin-type contactless IC card having improved portability by making the thickness thinner as a thin-type card form, and also having improved strength against bending and impact.

[0002]

[Prior Art] Conventionally, as a contactless IC card containing an IC module and a reception/transmission coil connected to the IC module for performing reception and transmission of signals contactlessly with an external device, there is known one as shown in perspective view in Fig. 4, in which the IC module X and the reception/transmission coil Y are housed inside a plastic case body Z consisting of a box body Z1 and a cover body Z2 and the box body Z1 and the cover body Z2 are adhered, or one in which the IC module X and the reception/transmission coil Y are placed inside a mold and plastic is integrated by injection molding.

[0003]

[Problems the Invention Attempts to Solve] In the above conventional contactless IC cards, in the one which is housed inside a plastic case body Z consisting of a box body Z1 and a cover body Z2 and the box body Z1 and the cover body Z2 are adhered, there was a concern that if the adhesion between the box body Z1 and the cover body Z2 was insufficient, water may intrude inside from the place of adhesion and the IC module X and the reception/transmission coil Y may be damaged, and in addition, the thickness was as thick as about 10mm. Also, in the one in which the IC module X and the reception/transmission coil Y are placed inside a mold and plastic is integrated by injection molding, not only did it involve labor for placing the IC module X and the reception/transmission coil Y inside the mold, but also there were problems such as that if one formed thin, flat plate-shaped objects by injection molding, warping was caused, and those having good external appearance could not be obtained.

[0004]

[Means for Solving the Problems] The present invention solves the above problems, and its essence is a thin-type contactless IC card, being a thin-type contactless IC card containing a thin-type IC module and a thin-type reception/transmission coil connected to the IC module for performing reception and transmission of signals contactlessly with an external device, wherein said thin-type IC module and thin-type reception/transmission coil are disposed on a plane without being made to overlap, in addition, plastic films are interposed on both sides of the thin-type IC module and the thin-type reception/transmission coil, furthermore they are held between plastic surface members from both sides, and they are fixed and integrated by thermocompression bonding, whereby the portability is improved by making the thickness thinner as a thin-type card form, also the strength is improved against bending and impact, and the thin-type IC module and the thin-type reception/transmission coil are assuredly blocked from the outside, whereby it is possible to prevent damage to the thin-type IC module and the thin-type reception/transmission coil by intrusion of water from the outside.

[0005]

[Working Example] Below, a working example of the present invention is explained in detail based on the drawings. Fig. 1 is a plan view showing a thin-type contactless IC card of the present invention, Fig. 2 is a sectional view showing the essential components of a thin-type contactless IC card of the present invention, and Fig. 3 is a side sectional view showing the condition of manufacturing of a thin-type contactless IC card of the present invention.

[0006] As shown in plan view in Fig. 1, the external measurements of the thin-type contactless IC card 10 are horizontal measurement about 86mm, vertical measurement about 54mm, and the thickness is about 1mm. The thin-type contactless IC card 10 contains a thin-type IC module 11 having an IC memory (not illustrated) and a rectifying circuit, and the like (not illustrated), and a thin-type reception/transmission coil 12 connected to the thin-type IC module 11. 13 is an embossed area, and it is formed avoiding the position where the thin-type IC module 11 is contained and the position where the thin-type reception/transmission coil 12 is contained. Thus, if the embossed area 13 is formed avoiding the position where the thin-type IC module 11 is contained and the position where the thin-type reception/transmission coil 12 is contained, it is optimal because even though the embossed area 13 is embossed, there is little influence on the thin-type IC module 11 and the thin-type reception/transmission coil 12. As shown in sectional view in Fig. 2, the thickness T1 of the thin-type IC module 11 is about 0.3mm. The thin-type reception/transmission coil 12 has a copper wire 12b having a diameter of about 0.1mm wound on a flat plate-shaped ferrite core 12a having a thickness T2 of about 0.4mm, and the thickness T3 is about 0.5mm. The thin-type reception/transmission coil 12 performs reception and transmission of information stored in the thin-type IC module 11 with an external device by electromagnetic coupling or electromagnetic induction with the external device. The alternating current excited by the thin-type reception/transmission coil 12 is rectified by the rectifying circuit provided in the thin-type IC module 11, and it is taken as the power supply of the thin-type IC module 11. Therefore, there is no need to separately contain a battery.

[0007] 14, 14 are plastic films made of polyvinyl chloride, or the like, having a thickness of about 0.1mm, and they are interposed so as to hold between them the thin-type IC module 11 and the thin-type reception/transmission coil 12 from both sides of the thin-type IC module 11 and the thin-type reception/transmission coil 12, and in addition, this is held between plastic surface members 15, 15 made of polyvinyl chloride, or the like, from both sides of the plastic films 14, 14 made of polyvinyl chloride, or the like, having a thickness of about 0.3mm, they are fixed and integrated by thermocompression bonding, and the thickness is about 1mm.

[0008] To manufacture a thin-type contactless IC card 10 of the present invention, as shown in side sectional view in Fig. 3, the thin-type IC module 11 and the thin-type reception/transmission coil 12 should be placed so as not to overlap, the plastic films 14, 14 made of polyvinyl chloride, or the like, having a thickness of about 0.1mm should be interposed on both sides of the thin-type IC module 11 and the thin-type reception/transmission coil 12, furthermore they should be held from both sides between the plastic surface members 15, 15 made of polyvinyl chloride, or the like, having a thickness of about 0.3mm, and then they should be fixed and integrated by thermocompression bonding between hot plates 20, 20.

[0009]

[Effect of the Invention] According to the present invention as above, the thin-type IC module and the thin-type reception/transmission coil are disposed on a plane without being made to overlap, in addition, plastic films are interposed on both sides of the thin-type IC module and the thin-type reception/transmission coil, furthermore they are held between plastic surface members from both sides, and they are fixed and integrated by thermocompression bonding, whereby it has advantages such as that the portability is improved by making the thickness thinner as a thin-type card form, also the strength is improved against bending and impact, and the thin-type IC module and the thin-type reception/transmission coil are assuredly blocked from the outside, whereby it is possible to prevent damage to the thin-type IC module and the thin-type reception/transmission coil by intrusion of water from the outside.

[Brief Explanation of the Drawings]

[Fig. 1] is a plan view showing a thin-type contactless IC card of the present invention.

[Fig. 2] is a sectional view showing the essential components of a thin-type contactless IC card of the present invention.

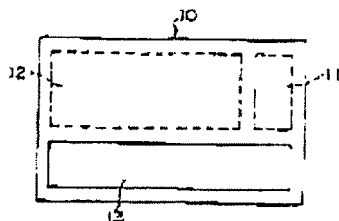
[Fig. 3] is a side sectional view showing the condition of manufacturing of a thin-type contactless IC card of the present invention.

[Fig. 4] is a perspective view showing a conventional contactless IC card.

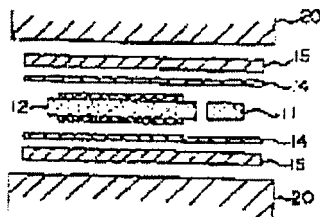
[Explanation of the Symbols]

- | | |
|----|---------------------------------------|
| 10 | Thin-type contactless IC card |
| 11 | Thin-type IC module |
| 12 | Thin-type reception/transmission coil |
| 13 | Embossed area |
| 14 | Plastic film |
| 15 | Plastic surface member |

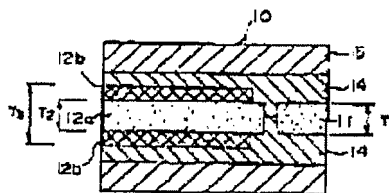
[Fig. 1]



[Fig. 3]



[Fig. 2]



[Fig. 4]

